

AD-A080 605

CENTER FOR NAVAL ANALYSES ALEXANDRIA VA  
DEVELOPING STRATEGIES FOR CLASS A AND C SCHOOL TRAINING, (U)  
AUG 79 W M EVANCO

F/G 5/9

N00014-76-C-0001

UNCLASSIFIED CNSR-6

NL

1 OF 1

AD  
A080605



END  
DATE  
FILMED  
3-80  
DDC



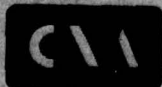
CNSR 6 / August 1979

12  
LEVEL

# DEVELOPING STRATEGIES FOR CLASS A AND C SCHOOL TRAINING

William M. Evanco

**DISTRIBUTION STATEMENT**  
Approved for public release;  
distribution unlimited.



**CENTER FOR NAVAL ANALYSES**

2000 North Beauregard Street, Alexandria, Virginia 22311

D'D'C  
RECEIVED  
FEB 13 1980  
A

80 2 13 008

**APPROVED FOR PUBLIC RELEASE;  
DISTRIBUTION UNLIMITED**

**Work conducted under contract N00014-76-C-0001**

**The work reported here was conducted under the direction of the Center for Naval Analyses and represents the opinion of the Center for Naval Analyses at the time of issue. It does not necessarily represent the opinion of the Department of the Navy except to the extent indicated by the comments of the Chief of Naval Operations.**



SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER <b>14</b> CNSR-6	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) <b>6</b> Developing Strategies for Class A and C School Training		5. TYPE OF REPORT & PERIOD COVERED
7. AUTHOR(s) <b>10</b> William M. Evanco		6. PERFORMING ORG. REPORT NUMBER
8. CONTRACT OR GRANT NUMBER(s) <b>15</b> N00014-76-C-0001		9. PERFORMING ORGANIZATION NAME AND ADDRESS Center for Naval Analyses 2000 N. Beauregard Street Alexandria, Virginia 22311
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS <b>1217</b>		11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Department of the Navy Arlington, Virginia 22217
12. REPORT DATE <b>11</b> Aug-1979		13. NUMBER OF PAGES <b>11</b>
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Office of the Chief of Naval Operations (Op96) Department of the Navy Washington, D.C. 20350		15. SECURITY CLASS. (of this report) Unclassified
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE		
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distributed unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES The work reported here was conducted under the direction of the Center for Naval Analyses and represents the opinion of the Center for Naval Analyses at the time of issue. It does not necessarily represent the opinion of the Department of the Navy except to the extent indicated by the comments of the Chief of Naval Operations.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) attrition, enlisted personnel, models, naval personnel, naval training, personnel management, PROPHET II, reenlistment, retention (general), schools		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The effects on first-term survival and reenlistment of delayed and normal entry into Class A schools for initial specialized training are analyzed. Ways of timing delayed entry to improve retention are suggested. A model for developing training plans to meet requirements for men with advanced specialized training in Class C schools is summarized. <b>K</b>		

110

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N 0102-LF-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

077 270

503



DEPARTMENT OF THE NAVY  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
WASHINGTON, D.C. 20350

IN REPLY REFER TO  
Ser 96/194107

DEC 26 1991

From: Chief of Naval Operations  
To: Distribution List

Subj: Enlisted Accession and Training (ENACT) Study

Encl: (1) Enlisted Accession and Training (ENACT) Study  
Summary Report; CNA Summary Report 6

1. The subject study was undertaken to aid in the Navy's management of relating training requirements and resources.

2. The study produced an analysis and model that may help the Navy improve retention behavior and reduce future training requirements. The effect that time of entry to Class A schools for initial specialized training has on first term survival and reenlistment is analyzed. Techniques to improve retention through delayed Class A school entry are provided. In addition, a training model is presented that develops Class C school training plans to meet requirements for advanced specialized training.

2. Enclosure (1) is forwarded.

M. C. HOLCOMB  
Vice Admiral, U.S. Navy  
Director, Navy Program Planning

Distribution List:  
(See Next Page)

Accession For	
NTIS GMLAI	<input checked="checked" type="checkbox"/>
DDC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist.	Availand/or special
A	

Distribution List:

SNDL

A1	ASSTSECNAV MRAL (only)
A2A	CNR, OPA (only)
A5	CHBUMED (ATTN: NM&S-2) (only)
A6	CMC (ATTN: DC/S, Manpower) (only)
B1	SECDEF (only)
B3	AFSC, NDU (only)
21A1	CINCLANTFLT
21A2	CINCPACFLT
24H1	COMTRALANT
24H2	COMTRAPAC
FF30	NAVMMAC
FF38	USNA (Nimitz Library only)
FF44	NAVWARCOL
FF48	HUMRESMANCEN
FJ18	COMNAVMILPERSCOM
FJ76	COMNAVCRUITCOM
FKA6A16	NAVPERSRANDCEN
FL3	DODCI
FL4	NARDAC (Washington, D. C. only)
FT1	CNET
FT5	CNTECHTRA
FT73	NAVPGSCOL
FT87	HUMRESMANSCOL
VI2	CG MCDEC
OPNAV:	OP-00K, OP-09BH, OP-09R, OP-90, OP-96, OP-966, OP-940, OP-01, OP-01T, OP-10, OP-11, OP-12, OP-13, OP-15, OP-29, OP-39, OP-59 (only)

Other:

Under Secretary of Defense, Research and Engineering  
Ass't Secretary of Defense (MRA&L)  
Ass't Secretary of Defense, Program Analysis & Evaluation (2 copies)  
Defense Technical Information Center (2 copies)  
Department of the Army Library  
Department of the Air Force (AF/PAC)  
Institute for Defense Analyses  
Human Resource Research Organization  
The RAND Corporation  
System Development Corporation



CNSR 6 / August 1979

# **DEVELOPING STRATEGIES FOR CLASS A AND C SCHOOL TRAINING**

William M. Evanco

Enclosure (1) to CNO Ltr Ser 96/194107 dated 26 Dec 1979



*Institute of Naval Studies*

**CENTER FOR NAVAL ANALYSES**

2000 North Beauregard Street, Alexandria, Virginia 22311



## TABLE OF CONTENTS

	Page
Preface . . . . .	iii
An analysis of delayed entry into class A schools . . . . .	1
Background characteristics . . . . .	1
Service characteristics . . . . .	2
Results . . . . .	2
Loss probability . . . . .	2
Reenlistment probability . . . . .	3
Conclusion . . . . .	3
PROPHET II: A model for personnel planning . . . . .	4
Inputs . . . . .	4
Computations . . . . .	6
Outputs . . . . .	7
Caveats . . . . .	7
References . . . . .	8
Study participants . . . . .	9

## **PREFACE**

Navy planners face a complex problem when developing programs for enlisted personnel training. They must determine how many recruits to train for each skill and when to train them so that they will be available in the right numbers when needed. Related to this is the need to improve retention behavior and reduce future training requirements.

The Enlisted Accession and Training (ENACT) Study produced an analysis and a model that may help the Navy manage its training programs. The first section reports an analysis of the effects that delayed entry to Class A schools for initial specialized training has on first-term survival and reenlistment. It suggests some ways to time entry into Class A schools that would improve retention. The second section summarizes a model for developing Class C school training plans to meet requirements for men with advanced specialized training.

## AN ANALYSIS OF DELAYED ENTRY INTO CLASS A SCHOOLS (Reference 1)

Enlistees may attend Class A schools — initial specialized training schools — immediately after recruit training (non-delayed) or after a tour in the fleet (delayed). In this analysis, the backgrounds, service records, first-term loss rates, and reenlistment rates are compared for the two types of enlistees.

The analysis was based on data for calendar year 1973 entrants to the Navy. This group was chosen because by 1973 most enlistees were true volunteers, and they had time to complete 4 years of service.

### BACKGROUND CHARACTERISTICS

The background characteristics of the training-delayed group differ substantially from those of the non-delayed group. As shown in table 1, the delayed cohort is of lower quality. On the average about 40 percent of the delayed cohort have less than 12 years of education, against only 15 percent for the non-delayed. About 60 percent of the delayed are below average in mental ability (mental groups 3L and 4), compared with only 15 percent for the non-delayed.

TABLE 1  
BACKGROUND AND SERVICE CHARACTERISTICS (Percentages)

Characteristics	Delayed cohort	Non-delayed cohort
Education < 12	40.3	14.7
Mental groups 3L-4	60.3	15.0
Age 17	35.8	21.0
Non-whites	19.0	6.0
First tour on carrier	24.3	9.3
Time delay (in months)	18.8	5.3
Fleet time (in months)	12.3	—
Payback period (in months)	25.3	36.9
Service after A school (in months)	45.0	47.0

Training delayed recruits are generally younger at enlistment. About 36 percent of those in the study were 17 years old; only 21 percent of the non-delayed were that young. Non-whites constituted about 19 percent of the delayed group and 6 percent of the non-delayed.



## SERVICE CHARACTERISTICS

Table 1 also shows that about 25 percent of recruits who entered A school with fleet experience had served on aircraft carriers; 16 percent of recruits are assigned to carriers on general detail.

The mean time between entry to the Navy and the completion of the first A school (time delay) was 19 months for delayed individuals and 5 months for non-delayed. Delayed individuals spent, on the average, about 12 months in the fleet before A school. Accordingly, those delayed served an average of 12 fewer months on fleet duty after A school (payback period) during their first enlistments.

The school-delayed group has higher reenlistment rates: 41 percent against 21 percent for the non-delayed. In a 4-year term of reenlistment, service to the Navy after A school averages 45 months for the delayed group — only 2 months less than the average for non-delayed.

## RESULTS

### Loss Probability<sup>1</sup>

Among the school-delayed, lower quality recruits had lower loss rates than recruits with better qualifications. This is consistent with the interpretation that recruits of lower quality are screened more carefully through on-the-job performance than are recruits who meet the test-score requirements for A school.

In contrast, loss probabilities for the non-delayed group increase as education and mental group standing decrease. Moreover, except for mental group 1 enlistees, loss probabilities are consistently higher for members of the non-delayed group given level of education and mental group standing.

The loss probability for recruits whose first tour of duty is in an activity classified as "other"<sup>2</sup> is appreciably higher than the loss probabilities for the remaining duty types. Recruits in the "other" category may not have been adequately screened. "Other" usually involves shore duty. This might provide inadequate preparation for life in the fleet. Moreover, an individual may have been assigned to A school while in recruit training, spending several months in the "other" activity type while awaiting a school seat. Such recruits will not have been adequately screened.

<sup>1</sup>See reference 2 for details of the procedure used to compute probabilities.

<sup>2</sup>The activities are carriers, submarines, repair ships, sea-based air, land-based air, amphibious ships, auxiliary and patrol, and construction battalion; recruits in an activity not encompassed by these classifications are placed in the "other" category.

### Reenlistment Probability

In both groups, reenlistment probability is related inversely to educational level, mental group standing, and age at enlistment.

The activity type accounts for more of the variation in reenlistment probabilities than all background characteristics (except for the number of primary dependents and race). Reenlistment probabilities for the base group<sup>1</sup> range from 18 to 48 percent for the delayed, and from 8 to 29 percent for the non-delayed. Recruits assigned to submarines have the highest reenlistment rates. On the other hand, enlistees in construction battalions have the lowest reenlistment probabilities. It appears that the qualities associated with various activities play a more important role in reenlistment decisions than background characteristics.

### CONCLUSION

Delayed entrance to A school for lower quality recruits may offer a number of benefits to the Navy. Postponing the selection of recruits for A school until they have had fleet experience gives the Navy an opportunity to choose individuals through on-the-job performance. By applying this standard, in addition to mental group standing, educational attainment, and other background characteristics, the Navy can reduce the errors associated with selecting recruits entirely on the basis of test scores. Furthermore, the Navy's ability to meet its A school quotas can be enhanced by identifying through job performance individuals who might not otherwise be eligible for A school. Lastly, an expanded effort to select individuals for A school on the basis of performance in the fleet may provide added incentives for such recruits to perform.

---

<sup>1</sup>The base group consists of Caucasian individuals 18-19 years old with 12 years of education who are in mental group 2 and have no dependents.

## PROPHET II: A MODEL FOR PERSONNEL PLANNING

(Reference 3)

PROPHET II is related to two other personnel models developed at CNA: ENREP and PROPHET I. Given a Navy force structure, ENREP (Enlisted Requirements Planner) (reference 3) estimates the required composition of the Navy enlisted ranks by paygrade, rating, and quantity. PROPHET I (Projection of Personnel with Historical or Estimated Transitions) (reference 4) can convert a rating structure into a plan for initial specialized training in Class A schools. On the other hand, if Class A school plans are given, then PROPHET I can estimate the personnel inventory by rating that results from these plans.

The Navy enlisted classification (NEC) is a further refinement of ratings. NECs are principally acquired through advanced specialized training in C schools. PROPHET II (reference 5) was designed to convert requirements by NEC into a training plan for C schools. Conversely, if C school plans are given, the numbers of personnel by NEC can be estimated. However, there is no model analogous to ENREP that can derive the numbers of personnel required by NEC from a given Navy force structure.

In PROPHET II, the personnel inventory disaggregated by NEC is further characterized by length of service (LOS) from 1 to 31 years and by time until expiration of active obligated service (EAOS) from 1 through 6 years. The starting — base year — inventory is projected to a new year by application of continuation rates, and then new accessions generated by C schools, on-the-job training (OJT), and switches from non-primary to primary NECs are added.<sup>1</sup> This process is repeated for as long as 7 years.

In summary, PROPHET II can:

- Project inventories of NECs for up to 7 years
- Produce C school plans to meet specified NEC requirements
- Generate NEC inventories, given specific C school plans
- Project reenlistments and expired enlistments by NEC.

### INPUTS

Six kinds of data are used:

- Initial inventories characterized by NEC, LOS, and EAOS

<sup>1</sup> An individual may have more than one advanced specialty skill, in which case the one currently in use is the primary NEC.



- Continuation rates for each group in the inventory by NEC, LOS, and EAOS
- Gains to the inventory identified by the method by which the specific NEC was obtained, as well as the LOS
- The percentages of each type of gain by EAOS
- C school training plan when the option is to project NEC inventories
- NEC inventories when the option is to project C school training plans.

Also, the user must supply a file listing NECs and their associated C school codes and ERCs<sup>1</sup> in use during the first and projection years.

The first four kinds of data are derived from the Enlisted Master Record (EMR)<sup>2</sup>. EMR files for the ends of consecutive fiscal years are used. The second fiscal year becomes the base year, and each year thereafter is a projection year.

If an individual appears on both EMR files with the same NEC he is classified as a continuer, if he only appears on the first file he is counted as a loss, and if only on the second file, a gain.

Continuation rates are defined as the fraction of individuals appearing on the first EMR who also appear on the second EMR. These rates are assumed to be constant.

In addition to continuers, persons may appear on the base year file by one of the following routes:

- Graduation from a C school for that NEC
- On-the-job training (OJT)
- Switching of a non-primary NEC to the primary position (lateral-in)
- An unknown method (where, for example, an individual may have graduated from a C school but the fact has not been recorded on the EMR).

The numbers of OJT gains, lateral-ins, and gains from the unknown method are assumed to be constant in each of the projection years. C school gains are distributed by LOS and EAOS on the basis of historical proportions.

<sup>1</sup>ERC stands for Enlisted Rating Coordinator; each ERC manages several NECs.

<sup>2</sup>These are personnel records maintained for each Navy enlistee.

## OUTPUTS

PROPHET II offers a variety of output options. Projected inventories, lateral-ins, C school gains, OJT gains, losses, expired enlistments, and reenlistments may be displayed along the LOS and EAOS dimensions.

Another option permits the user to display "bag rates" by LOS (defined as the weighted average of continuation rates across EAOS). Finally, when the requirements by NEC are given, C school training requirements may be displayed.

## CAVEATS

The continuation rates are assumed to be constant. Moreover, some cells are small. In such cases, rates calculated for the base year may be far from representative.

It is assumed that the targets for each year of the C school training plan are met. If, during the first projection year, the actual number of C school graduates is less than the planned number, projections for subsequent years will be in error.

PROPHET II projects inventories only for primary NECs granted by C schools. It assumes that the numbers moving from secondary to primary NECs (lateral-ins) in the base year remain constant.

Sea/shore rotation is ignored. It is assumed that the current inventory and requirements as specified by the user accurately reflect the proper sea/shore balance for future years.

Finally, PROPHET II cannot project inventories for two groups of NECs. The NECs under ERC 5I (Cryptologic Technician) are excluded because their hierarchies are very complex and their EMR coding is not standard. In addition, all NECs under ERC 5T (underwater demolition technicians, divers, etc.) are excluded because of small sample size.

## REFERENCES

1. Center for Naval Analyses, Research Contribution 390, "An Analysis of Delayed Entry Into Class A Schools," by W. M. Evanco, Unclassified, May 1979
2. Center for Naval Analyses, Professional Paper 247, "Selectivity Bias in the Analysis of Military Manpower and Personnel Problems," by W. M. Evanco, Unclassified, Apr 1979
3. Center for Naval Analyses, Research Contribution 358, "The Enlisted Requirements Planner," by D. W. Schulte, Unclassified, Oct 1978
4. Center for Naval Analyses, Research Contribution 346, "The Prophet System for Projection of Inventories in Ratings and Other Subpopulations," by M. D. Joseph, Unclassified, May 1978
5. Center for Naval Analyses, Research Contribution 361, "The Prophet II System for Projection of Inventories in Navy Enlisted Classifications," by M. D. Joseph, Unclassified, Aug 1978



**ENLISTED ACCESSION AND TRAINING STUDY**

William Evanco (Study Director)

Jean Fletcher

Cdr. Edward Barrow

Marc Joseph

Bruce Simon